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A survey of mimetid spiders (Araneae, Mimetidae) from Central Guizhou Province, China

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Abstract

A survey of the mimetids of Central Guizhou Province, China, is presented. A total of five species are addressed, raising the number of species of the genus *Mimetus* Hentz, 1832, known from this province from four to eight, making Guizhou the province with the most *Mimetus* species in China. Two of the taxa are new species: *M. guiyang* J. S. Zhang, Yu & Xu, **sp. nov.** and *M. lanmeiae* Liu, Yu & Xu, **sp. nov.**, both from Guiyang City, provincial capital of Guizhou. The other three known species include two new records from Guizhou, *M. caudatus* Wang, 1990, and *M. sinicus* Song & Zhu, 1993, as well as a species, *M. testaceus* Yaginuma, 1960, that was previously recorded from the province. The female of *M. caudatus* is described for the first time, based on the new material from Duyun City. Detailed descriptions, diagnoses, and photographs of the two new species and *M. caudatus*, as well as photographs of *M. sinicus* and *M. testaceus*, are provided. The DNA barcodes of *M. lanmeiae* **sp. nov.**, *M. sinicus*, and *M. testaceus* were obtained for species delimitation, matching of sexes, and future use.

Key Words

DNA barcoding, Guiyang City, morphology, new species, taxonomy

Introduction

Mimetidae is a small-sized spider family, comprising eight genera and 163 valid species distributed worldwide, often referred to as “pirate spiders” or “cannibal spiders”, are named for their araneophagic behaviors and predatory strategies (Harms and Harvey 2009a, b; Benavides et al. 2017; Benavides and Hormiga 2020; WSC 2025; see also Fig. 1A, B). Rather than constructing foraging webs, these spiders invade the webs of other spiders, where they simulate the vibrations of prey caught in the web or mimic the courtship signals of conspecific males. This sophisticated, deceptive, predatory tactic lures the resident spider into proximity, enabling the mimetid to ambush and feed on it, and is a well-documented example of aggressive mimicry (Cutler 1972; Jackson and Whitehouse 1986; Kloock 2001, 2012; see also Fig. 1C, D). Traditionally, mimetids were considered obligate araneophages, preying exclusively on other spiders. However, evidence from previous studies (Cutler 1972; Kloock 2001, 2012) and our own observations (Fig. 1E, F) indicates that these spiders are capable of consuming other arthropods. This may occur through kleptoparasitism, wherein mimetids exploit the webs of other spiders to acquire prey, or through active foraging behavior to locate alternative food sources.

Reflecting their highly specialized ecological niche, members of the family Mimetidae exhibit notable morphological adaptations, including prominent rows of raptorial spines on their anterior legs. These spines are strategically arranged to create a basket-like structure, effectively ensnaring prey during capture (Cutler 1972; Jackson and Whitehouse 1986; Harms and Harvey 2009a, b; Benavides et al. 2017; Benavides and Hormiga 2020; see also Figs 1A, F). Clearly, the biology of mimetid spiders is

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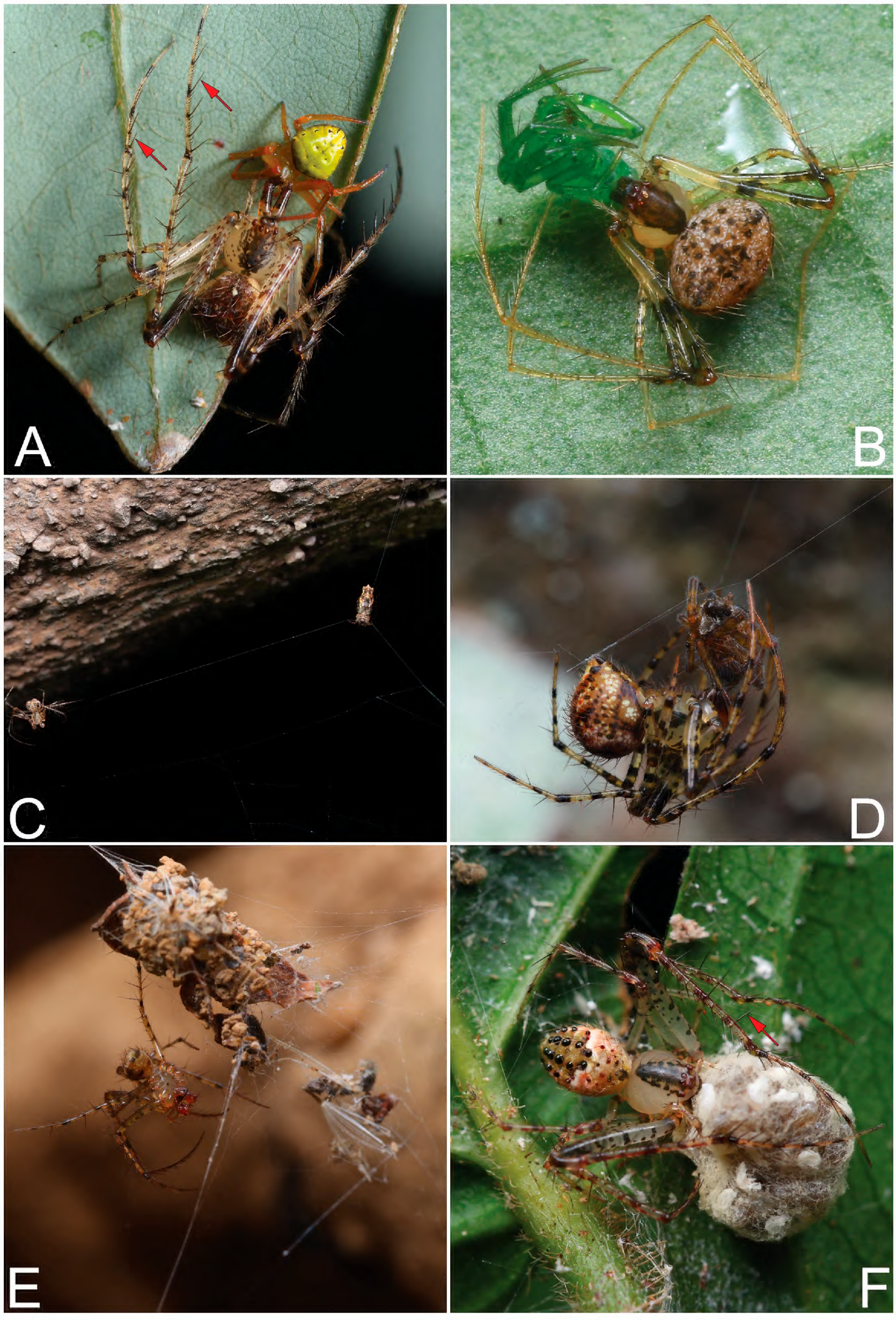

Figure 1. Araneophagic behaviors (**A, B**), predatory strategies (**C–F**), and rows of raptorial spines of mimetid spiders (**A, F**) **A.** *Mimetus* spp. has attacked and killed another spider of the family Araneidae; **B.** Mimetidae spp., feeding on an immature spider of an unknown family; **C.** Mimetidae spp. assaulting the web of a spider of genus *Cyclosa*; **D.** Mimetid at the end of a lunge toward and capture of a spider. Prey is held by a 'basket' formed by legs I–III of the mimetid. **E.** Mimetidae spp. had previously driven the resident from the web, thereby gaining exclusive access to the prey remaining on the web **F.** Mimetidae spp. wrapped up prey and scooped it up in a basket formed by legs I–III. Photographs by Q Lu (Shenzhen). **Note:** Red arrows in panel A and panel F point at raptorial spines on anterior legs.

unique, yet our understanding of them remains limited. Moreover, details of novel predatory strategies continue to emerge, highlighting the need for further investigation (Barrantes et al. 2025). However, the family Mimetidae serves as a typical example of how 'taxonomic ignorance of a group often discourages behavioral studies,' as highlighted by Jackson and Whitehouse (1986). Although the taxonomy of mimetid spiders has seen some groundbreaking advances in the new century, such as those by Harms and Harvey (2009a, b), Benavides and Hormiga (2016, 2020), and Benavides et al. (2017), there remains a substantial amount of work to be done. For alpha taxonomy, the diversity of Mimetidae remains insufficiently known, as a new genus and several new species have been described in recent years, and further new genera and species are expected to be established or discovered in the future (WSC 2025). For beta taxonomy, there is much dispute historically about the group's limits and its placement in the spider tree of life (Hormiga and Griswold 2014). Although the family has been revised regionally (Heimer 1986; Harms and Harvey 2009a, b; Benavides et al. 2017; Benavides and Hormiga 2016, 2020), the debate on the internal structure of this family remains open. Meanwhile, due to the lack of foundational data, particularly alpha-taxonomic information such as available specimens, molecular data, detailed descriptions, and high-quality diagnostic illustrations, phylogenetic studies on Mimetidae are somewhat biased both geopolitically and at the genus and species level, as the majority of studies have been carried out using Australian and Neotropical taxa (e.g., Heimer 1986; Harms and Harvey 2009a, b; Benavides et al. 2017; Benavides and Hormiga 2016, 2020), with only very few studies performed in Asia (Liu et al. 2021a, b), and some genera and most species from China were not included in the aforementioned phylogenetic revisions (Benavides and Hormiga 2020; Liu et al. 2021a, b).

Mimetus Hentz, 1832, is the type genus of the family and currently includes 70 extant species that are found worldwide except for the Polar Regions and Oceania, 20 of which are known to occur in China (WSC 2025; Table 1). As the most common genus of mimetids, *Mimetus* remains inadequately studied, and the species diversity is still insufficiently known. The possible reasons include, but are not limited to, the following: More than half of the species were only described based on a single sex (12 from males, 26 from females) (WSC 2025); most species documented in the 19th and 20th centuries were described based solely on somatic characters, with original descriptions being rather brief, illustrations either absent or inadequate, and lacking subsequent updates (Gan et al. 2019; Liu et al. 2021a, b; WSC 2025); types of some species do not exist (were not designated in original descriptions or are lost) or are difficult to locate or access (WSC 2025); *Mimetus* has been widely regarded as polyphyletic and will likely be split in the future (Benavides and Hormiga 2020; Liu et al. 2021a, b). In spite of these deficiencies, the majority of Chinese species have been described or redescribed in detail, alongside high-quality illustrations, to allow for easy recognition within this country (Zeng et al. 2016, 2019; Gan et al. 2019; Liu et al. 2021a, b; Wang et al. 2024).

Guizhou Province is recognized for its remarkable biodiversity, ranking among the top provinces in China and boasting the third-largest number of wildlife species nationally (Wang 2021; The People's Government of Guizhou Province 2022). The province is renowned for its diverse environments and complex topography, encompassing various habitats favored by mimetid spiders, such as subtropical evergreen broadleaf forests and karst landforms (Liu et al. 2021b; Zhao et al. 2021; Zhou et al. 2023). However, the genus *Mimetus* can be regarded as being poorly represented in Guizhou for a long time, with only two species recorded before 2019: *M. testaceus* Yaginuma, 1960, and *M. lamellaris* Zeng, Wang & Peng, 2016 (Wang 1990; Zeng et al. 2016). Until now, only four species have been recorded from Guizhou, including two new species that were described by Gan et al. (2019): *M. bucerus* Gan, Mi, Irfan, Peng, Ran & Zhan, 2019, and *M. yinae* Gan, Mi, Irfan, Peng, Ran & Zhan, 2019.

While examining spiders collected from Guiyang City (provincial capital of Guizhou) and adjacent areas (Fig. 2A), southwest China, we have found some *Mimetus* specimens that belong to five species: two species are new to science, one identified as *M. caudatus* Wang, 1990 (previously described based on male specimens only, new record for Guizhou) based on comparison with the type specimens, and the remaining two are identified as *M. sinicus* Song & Zhu, 1993 (new record for Guizhou) and *M. testaceus*, respectively. Thus, the total number of *Mimetus* species in Guizhou reaches eight, making Guizhou the province with the most *Mimetus* species in China (Fig. 2A, B; Table 1).

The goal of this paper is to describe the two new species; to redescribe *M. caudatus* and report the female for the first time; to provide color photographs of *M. sinicus* and *M. testaceus*; and to use DNA barcodes of *M. lanmeiae* sp. nov., *M. sinicus*, and *M. testaceus* for species delimitation, gender matching, and future use in molecular studies.

Materials and methods

Specimens in this study were collected by hand, pitfall trap, and beating vegetation. All examined specimens are deposited in the Museum of Guizhou Normal University, Guiyang, China (**MGNU**), except the holotype of *M. caudatus*, which is deposited in the College of Life Science, Hunan Normal University (**HNU**). Specimens were preserved in 75% or 95% alcohol and examined using an Olympus SZX7 stereomicroscope. Left male palps were examined and illustrated after dissection. Epigynes were removed and cleared in a warm 10% potassium hydroxide (KOH) solution. For *M. caudatus* and *M. guiyang* sp. nov., the vulvae were also imaged after being embedded in Arabic gum. Images were captured with a Canon EOS 70D digital camera (20.2 megapixels) mounted on an Olympus CX41 compound microscope and assembled using Helicon Focus 3.10.3 image stacking software (Khmelik et al.

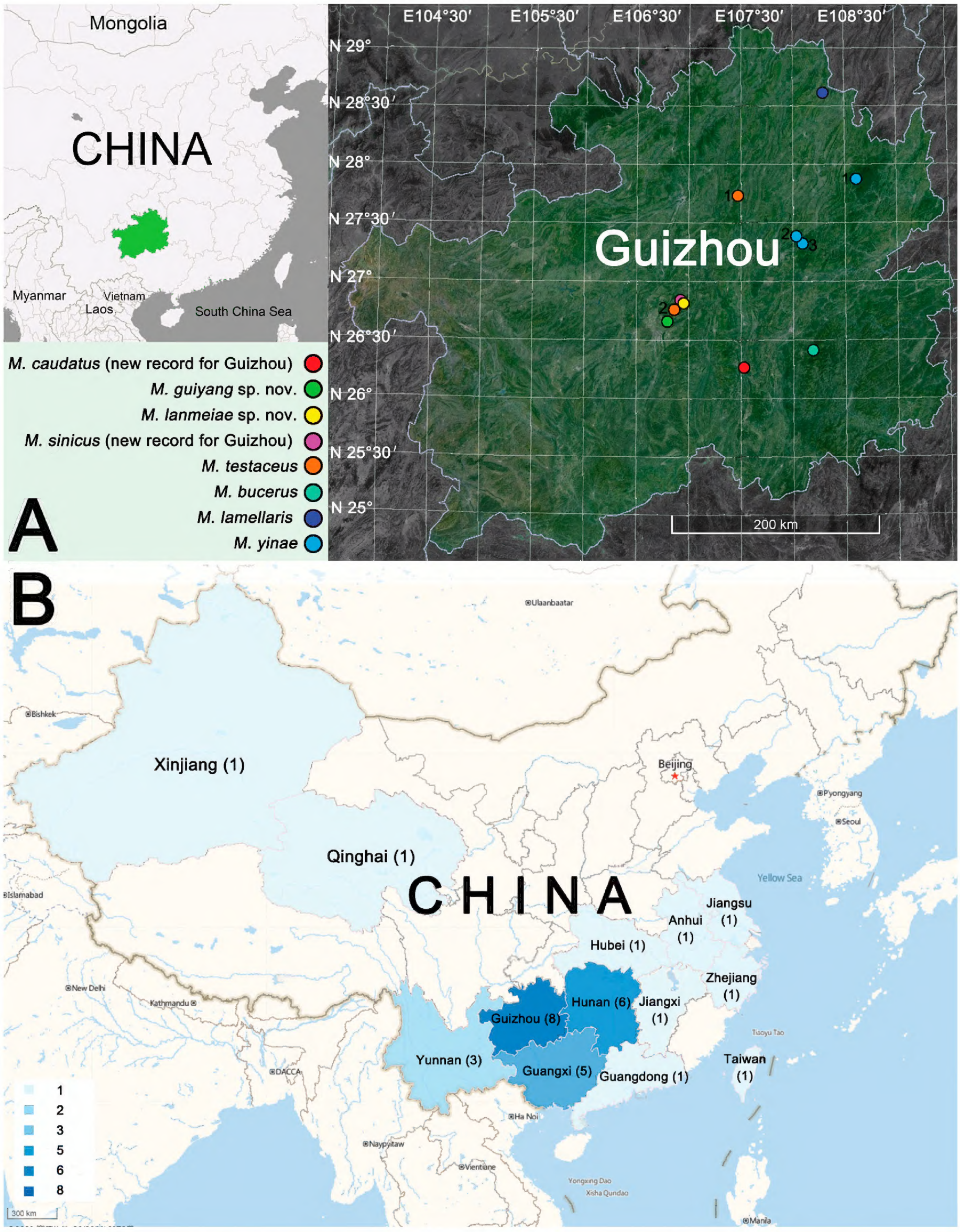

Figure 2. Distribution records of the *Mimetus* species in Guizhou Province (**A**) and species distribution pattern of the genus *Mimetus* in China (**B**). **Note:** In panel **A**, circles of different colors each represent a species. *Mimetus caudatus* Wang, 1990 (scarlet circle: Dunyun City, Xiaoweizhai Town, Yaolin Cave), *M. guiyang* sp. nov. (green circle: Guiyang City, Dongfeng Town), *M. lanmeiae* sp. nov. (yellow circle: Guiyang City, Xinpu Town, Xiangzhigou), *M. sinicus* Song & Zhu, 1993 (purple circle: Guiyang City, Xinpu Town, Xiangzhigou), *M. testaceus* Yaginuma, 1960 (orange circle: 1. Zunyi City; 2. Guiyang City, Shuitian Town, Panlongshan Forest Park), *M. bucerus* Gan, Mi, Irfan, Peng, Ran & Zhan, 2019 (cyan circle: Leishan County, Leigongshan National Nature Reserve), *M. lamellaris* Zeng, Wang & Peng, 2016 (dark blue circle: Yanhe County, Daheba Town, Mayanhe National Nature Reserve), *M. yinae* Gan, Mi, Irfan, Peng, Ran & Zhan, 2019 (light blue circle: 1. Jiangkou County, Dewang Town, Fanjingshan National Nature Reserve; 2. Shiqian County, Ganxi Town, Fuyan Village; 3. Shibing County, Maxi Town, BajiaopingVillage; In panel **B**, the shading of each province on the map and the numbers in parentheses after the province names represent species richness.

2005). All measurements were obtained using an Olympus SZX7 stereomicroscope and are given in millimeters. Eye diameters were measured at the widest part. The total body length does not include the chelicerae and spinnerets. Leg lengths are given as total length (femur, patella + tibia, metatarsus, tarsus). The terminology used in the text and figure legends follows Gan et al. (2019), Benavides and Hormiga (2020), and Liu et al. (2021a, b).

The abbreviations used in the text are: **A** atrium; **AER** anterior eye row; **ALE** anterior lateral eye; **AME** anterior median eye; **BP** basal plate; **C** conductor; **CA** cymbial apex; **CBE** cymbial base extension; **CD** copulatory duct; **CEMP** cymbial ecto-medial process; **CO** copulatory opening; **Cy** cymbium; **E** embolus; **EB** embolar base; **ET** embolar tip; **FD** fertilisation duct; **H** hood; **MOA** median ocular area; **Pc** paracymbium; **PER** posterior eye row; **PLE** posterior lateral eye; **PME** posterior median eye; **Sc** scape; **Sp** spermathecae; **St** subtegulum; **T** tegulum; **TA** tegular apophysis.

The distribution map was generated with ArcGIS 10.5 (ESRI Inc). Locality coordinates for *M. lamellaris*, *M. bucerus*, and *M. yinae* are copied from the original publications (see Zeng et al. 2016 and Gan et al. 2019). Due to a lack of locality coordinates in previous publications, locality coordinates for *M. caudatus*, *M. sinicus*, and *M. testaceus* originated from Google Earth, except for newly examined materials.

In order to obtain the DNA barcodes, a partial fragment of the mitochondrial cytochrome oxidase subunit I (COI) gene was amplified and sequenced using the primers LCOI490 (5'-GGTCAACAAATCATCATAAA-GATATTGG-3') and HCOI2198 (5'-TAAACTTCAGGGTGACCAAAAAAT-3'). However, we were unable to obtain good extractions from *M. guiyang* sp. nov. and *M. caudatus*. For additional information on extraction, amplification, and sequencing procedures, see Benavides et al. (2017). All sequences were analyzed using BLAST and are deposited in GenBank. The accession numbers are provided in Table 2.

Table 1. Checklist of *Mimetus* species from China.

	Species and Known sex	Distribution in China	References
1	*M. bucerus* Gan, Mi, Irfan, Peng, Ran & Zhan, 2019 (♂)	Guizhou	Gan et al. 2019
2	*M. caudatus* Wang, 1990 (♂♀)	Guangxi, Guizhou	Wang 1990; Song et al. 1999; female described in present paper
3	*M. clavatus* Liu, Xu, Hormiga & Yin, 2021 (♂)	Guangxi	Liu et al. 2021a
4	*M. contrarius* (Zeng, Irfan & Peng, 2019) (♂♀)	Yunnan	Zeng et al. 2019
5	*M. dentatus* Liu, Xu, Hormiga & Yin, 2021 (♂♀)	Guangxi	Liu et al. 2021a
6	*M. echinatus* Wang, 1990 (♂♀)	Hunan	Wang 1990; Song et al. 1999; Yin et al. 2012; Zeng et al. 2019
7	*M. juhuaensis* (Xu, Wang & Wang, 1987) (♂♀)	Anhui, Hunan	Xu et al. 1987; Song et al. 1999; Yin et al. 2012; Liu et al. 2021b
8	*M. labiatus* Wang, 1990 (♀)	Hunan	Wang 1990; Song et al. 1999; Yin et al. 2012
9	*M. lamellaris* Zeng, Wang & Peng, 2016 (♂)	Guizhou	Zeng et al. 2016
10	*M. liangkaii* Yao & Liu, 2024 (♂♀)	Jiangxi	Wang et al. 2024
11	*M. lingbaoshanensis* Gan, Mi, Irfan, Peng, Ran & Zhan, 2019 (♂♀)	Yunnan	Gan et al. 2019
12	*M. niveosignatus* Liu, Xu, Hormiga & Yin, 2021 (♂♀)	Guangxi	Liu et al. 2021a
13	*M. ryukyus* Yoshida, 1993 (♂♀)	Taiwan	Yoshida 1993; Song et al. 1999
14	*M. sinicus* Song & Zhu, 1993 (♂♀)	Hubei, Guizhou	Song and Zhu 1993; Song and Li 1997; Song et al. 1999; present paper
15	*M. subulatus* Liu, Xu, Hormiga & Yin, 2021 (♂♀)	Guangdong, Hunan	Liu et al. 2021a
16	*M. testaceus* Yaginuma, 1960 (♂♀)	Zhejiang, Hunan, Hubei, Guizhou, Guangxi	Wang 1990; Chen and Zhang 1991; Song et al. 1999; Yin et al. 2012; present paper
17	*M. tuberculatus* Liang & Wang, 1991 (♀)	Qinghai, Xinjiang	Liang and Wang 1991; Song et al. 1999
18	*M. uncatus* Liu, Xu, Hormiga & Yin, 2021 (♂)	Hunan	Liu et al. 2021a
19	*M. wangi* Zeng, Wang & Peng, 2016 (♂♀)	Yunnan	Zeng et al. 2016
20	*M. yinae* Gan, Mi, Irfan, Peng, Ran & Zhan, 2019 (♂♀)	Guizhou	Gan et al. 2019
21	*M. guiyang* J. S. Zhang, Yu & Xu, sp. nov. (♀)	Guizhou	present paper
22	*M. lanmeiae* Liu, Yu & Xu, sp. nov. (♂)	Guizhou	present paper

Table 2. Voucher specimen information.

Species	Inventory number	Voucher code	Sex	GenBank accession number	Sequence length
M. lanmeiae sp. nov.	MGNU-2022-MIML001	YHGY096	♂	PV213438	558 bp
M. sinicus	MGNU-2022-MIMS003	YHGY079	♂	PV213437	558 bp
	MGNU-2022-MIMS004	YHGY078	♀	PV213436	557 bp
M. testaceus	MGNU-2022-MIMT001	YHGY102	♂	PV213440	558 bp
	MGNU-2022-MIMT002	YHGY080	♀	PV213439	558 bp

Taxonomy

Family Mimetidae Simon, 1881

Genus *Mimetus* Hentz, 1832

Type species. *Mimetus syllepsicus* Hentz, 1832, from the USA and Mexico.

Mimetus caudatus Wang, 1990

Figs 2A, 3–5, 15

Mimetus caudatus Wang 1990: 42, fig. IV.4, 5 (♂, holotype, examined); Song et al. 1999: 73, fig. 30N, O (♂).

Type material. ***Holotype*** • ♂, China: Guangxi Zhuang Autonomous Region: Nanning City, Damingshan Mt., locality coordinates lacking in the original label, 11 VII 1985, J. Wang and Y. Zhang et al. leg. Examined.

Material examined. • 1♂1♀ (MGNU-2014-MIMC001 to 002), China: Guizhou Pro.: Duyun City, Xiaoweizhai Town, Yaolin Village, Yaolin Cave, 26.21°N, 107.53°E, c. 820 m, by hand, 18 VI 2014, P. Long et al. leg.

Diagnosis. Males of *M. caudatus* resemble those of *M. bucerus* and *M. lingbaoshanensis* in having a cylindrical conductor (C) extending outward, and a developed, distinctly prominent cymbial apex (CA) (cymbial apex unobtrusive in all other congeners which with cylindrical conductor distinctly extending, such as *M. echinatus*, *M. juhuaensis*, *M. lamellaris* and *M. yinae*; as in Zeng et al. 2016: figs 1B, C, 2A, B, 5B, C, 6A, B, Liu et al. 2021b: figs 3A–E, 5A–E and Gan et al. 2019: figs 5A, B, 6C, D), but can be easily differentiated from *M. bucerus* and *M. lingbaoshanensis* by: (1) in both pro- and retrolateral views, cymbial apex (CA) triangular (Fig. 3C, D) (*vs.* subuliform in *M. bucerus*, handle-like in *M. lingbaoshanensis*; Gan et al. 2019: figs 1B, C, 2A, B, 3C, D, 4A, B); (2) in retrolateral view, paracymbium (Pc) consisting of a conical basal outgrowth and a blade-shaped distal outgrowth (Fig. 3A, B, D) (*vs.* with a beak-like basal outgrowth and a claviform distal outgrowth in *M. bucerus*, with a claw-shaped basal outgrowth and a subtriangular distal outgrowth in *M. lingbaoshanensis*; Gan et al. 2019: figs 1C, 2B, 3D, 4B); and (3) palpal tibia slightly longer than wide, the ratio of length/width being approximately 1.3 (Fig. 3A–D) (*vs.* distinctly longer than wide, the ratio of length/width is at least 2.8 in *M. bucerus* and 2.0 in *M. lingbaoshanensis*; Gan et al. 2019: figs 1B, C, 2A, B, 3C, D, 4A, B). The female of *M. caudatus* can be distinguished from all other congeners with the exception of *M. lingbaoshanensis* by having a proximally biforked scape (Sc) (scape absent, or present but proximally not forked in other *Mimetus* species, such as *M. yinae* and *M. guiyang* sp. nov.; Gan et al. 2019: figs 5C, D, 6F, G and Fig. 6A, C) and similar vulva, but can be recognised by the Y-shaped scape (Sc) in *M. caudatus* (Fig. 4A, C) (*vs.* V-shaped in *M. lingbaoshanensis*; Gan et al. 2019: figs 3F, 4C) and by the dumbbell-shaped basal plate (Bp) with the posterior margin concave medially in *M. caudatus* (Fig. 4B, D) (*vs.* basal plate labiate, posterior margin slightly prominent medially in *M. lingbaoshanensis*; Gan et al. 2019: figs 3F, G, 4C, D).

Description. Male (MGNU-2014-MIMC001). ***Measurements.*** Total length 5.75. Carapace 2.97 long, 2.21 wide. Abdomen 2.78 long, 2.12 wide. Sternum 1.44 long and 0.95 wide. Labium wider than long. Clypeus height 0.26. Eye sizes and interdistances: AME 0.16, ALE 0.14, PME 0.15, PLE 0.15, AME–AME 0.18, ALE–AME 0.21, PME–PME 0.09, PME–PLE 0.30. MOA 0.50 long, anterior width 0.51, posterior width 0.40. Leg measurements: I 17.23 (4.59, 5.54, 5.06, 2.04), II 13.21 (3.73, 4.38, 3.42, 1.68), III 9.01 (2.78, 2.96, 1.95, 1.32), IV 10.37 (3.32, 3.46, 2.39, 1.20).

Habitus (Figs 4E, 5A–C). Carapace nearly pyriform, light yellowish, with a distinctive anchor-shaped pattern starting from behind PER and almost reaching fovea, a pair of small patches on the lateral margins of the carapace near the coxa II, and a pair of large patches on the lateral margins of the carapace near the coxae III and IV; fovea represented by a small pit; ocular region distinctly narrowed, cervical groove and radial grooves indistinguishable; tegument smooth, clothed with short, sparse setae along radial grooves. Sternum light brown, shaped like a shield. Labium nearly oblong, reddish brown. Endites anteriorly white, posteriorly reddish brown, with dense scopulae on inner margin. Chelicerae dark brown, promargin with 11 peg teeth, retromargin with only one normal tooth. Leg color similar to that of carapace, with irregular brown annuli in the middle parts of femur. Abdomen oval, yellowish white, dorsally covered by many small whitish and large black patches, with many weakly ossified hair bases still remaining, but almost all hairs broken off from body and lost; venter basically light brown, centrally with a V-shaped grayish stripe, posteriorly with two irregular-shaped grayish speckles.

Palp (Fig. 3A–D). Tibia short, < 1/3 of cymbium length, about 1.3 longer than wide. Cymbium (Cy) with basal extension (CBE) and an elongated apex (CA): cymbial base extension (CBE) represented by a semi-circular flange; cymbial apex (CA) shaped like index finger in ventral and dorsal views and triangular in lateral view, ca. 1/3 of cymbium length, pointing dorsal-retrolaterally. Paracymbium (Pc) broad, consisting of a conical basal outgrowth and a blade-shaped distal outgrowth, ca. 1/3 of cymbium length. Tegulum (T) nearly circular, centrally and apically membranous; sperm duct sinuate, forming a loop along tegular margin. Tegular apophysis (TA) sheet-shaped in ventral view and digitiform in prolateral view, located at proximal-prolateral position of tegulum (ca. 8–9 o'clock position of tegulum). Subtegulum (St) located posteriorly to tegulum, without apophysis. Embolus (E) filiform, arising at approximately the 7–8 o'clock position, terminating at ca. 12 o'clock position, with the tip (ET) hidden by conductor. Conductor (C) large, cylindrical, nearly as long as tegulum diameter, proximally partly membranous, apically disc-shaped and strongly sclerotized, dorsally with two hook-shaped apophyses and a sheet-shaped fold.

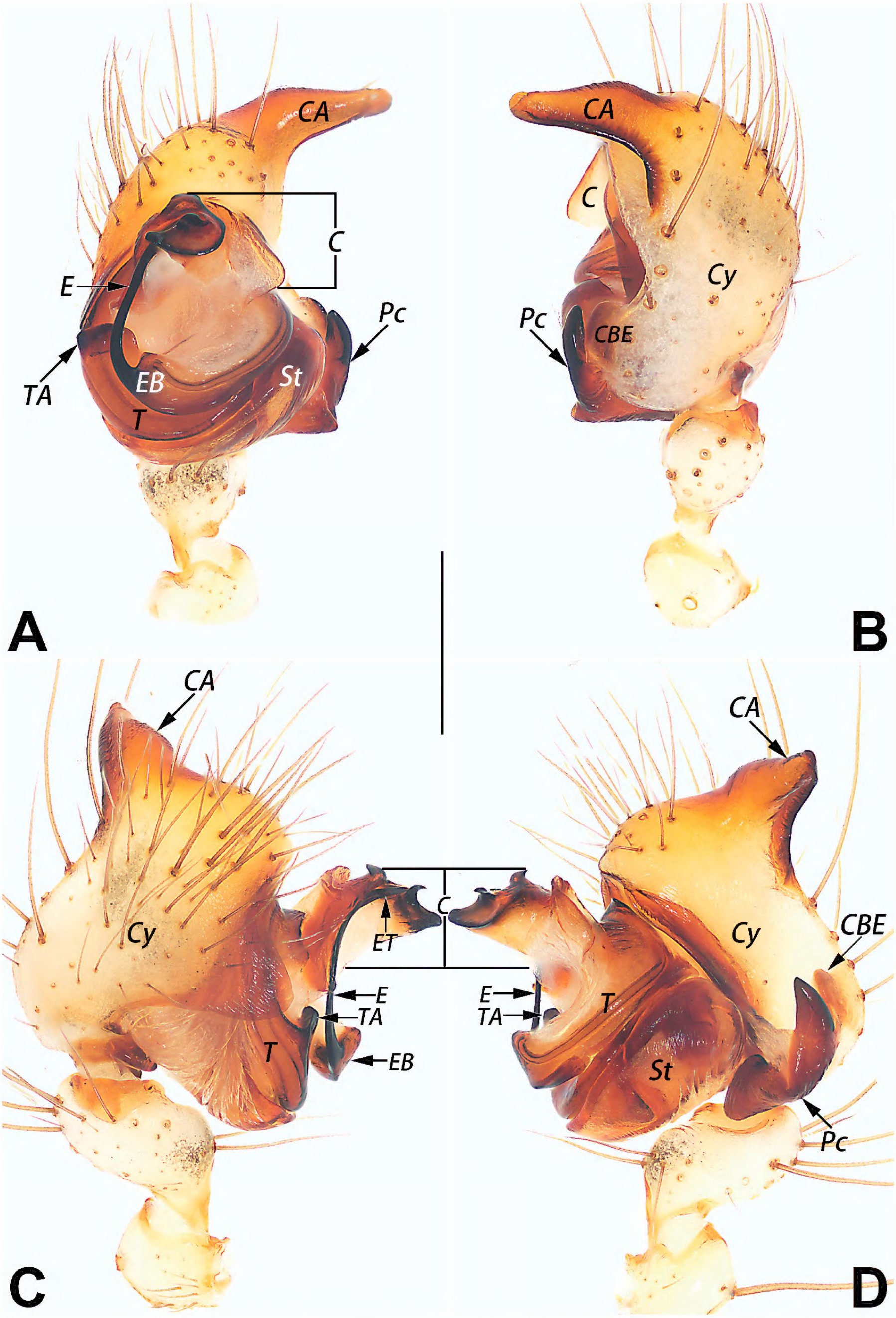

Figure 3. Male palp of *Mimetus caudatus* Wang, 1990 **A.** Ventral view; **B.** Dorsal view; **C.** Prolateral view; **D.** Retrolateral view. Abbreviations: C = conductor; CA = cymbial apex; CBE = cymbial base extension; Cy = cymbium; E = embolus; EB = embolar base; ET = embolar tip; Pc = paracymbium; St = subtegulum; T = tegulum; TA = tegular apophysis. Scale bar: 0.5 mm (equal for **A–D**).

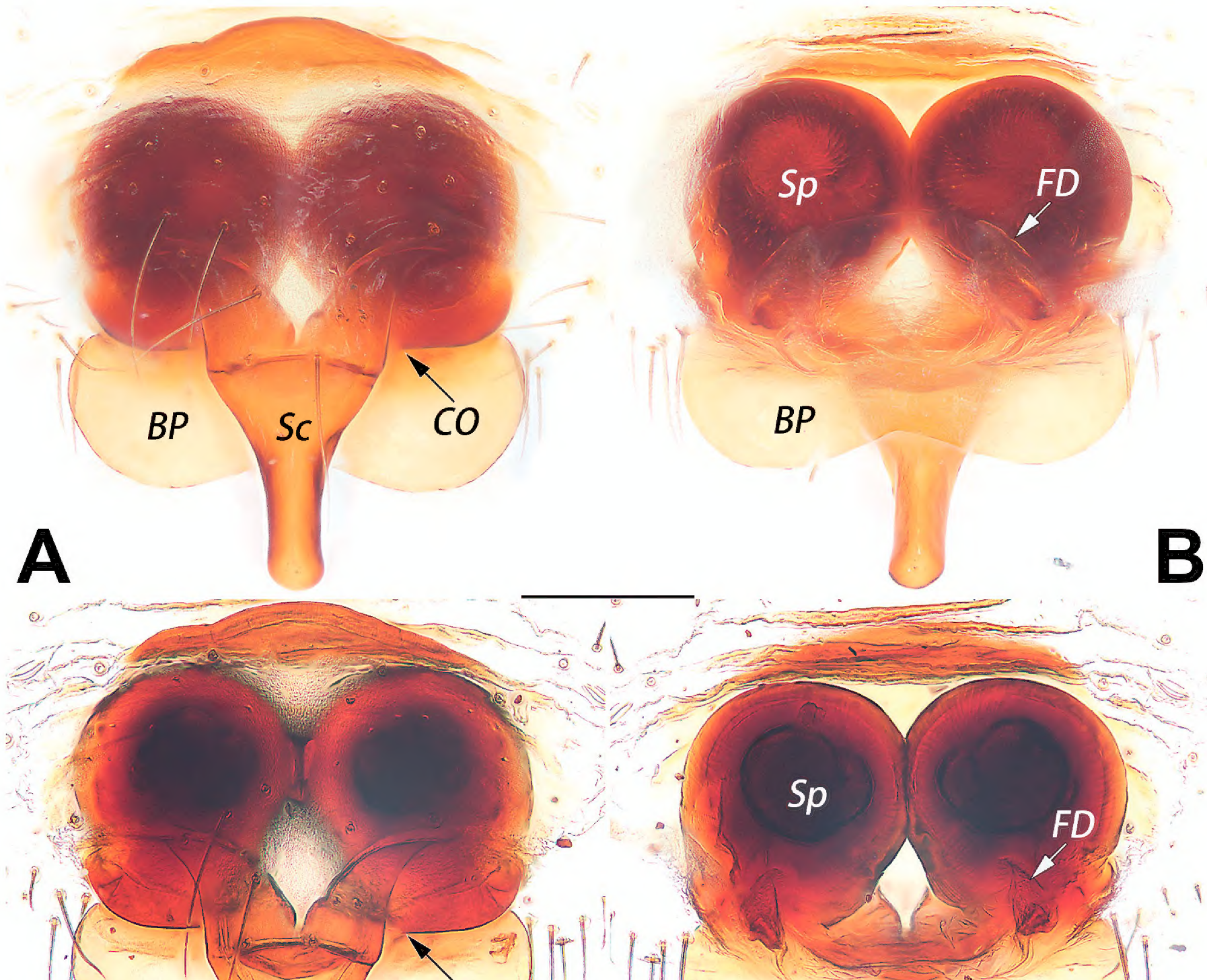

Figure 4. *Mimetus caudatus* Wang, 1990, epigyne (**A–D**) and frontal view of prosoma (**E, F**). **A, B.** Macerated epigyne, ventral and dorsal; **C, D.** Epigyne, macerated and embedded in Arabic gum, ventral and dorsal; **E.** Male; **F.** Female. Abbreviations: BP = basal plate; CO = copulatory opening; FD = fertilisation duct; Sc = scape; Sp = spermathecae. Scale bar: 0.2 mm (equal for **A–D**); 1 mm (equal for **E, F**).

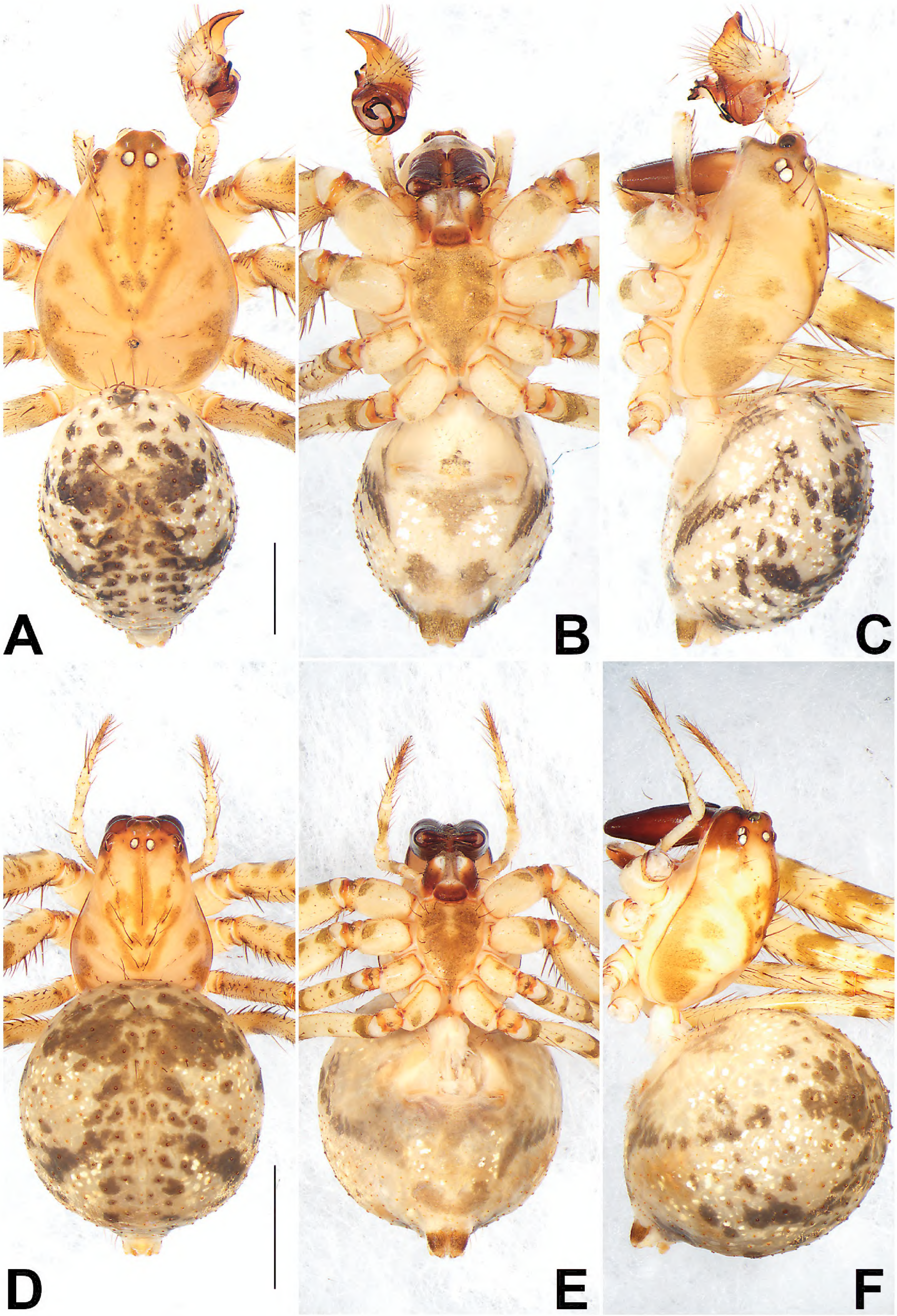

Figure 5. Habitus of *Mimetus caudatus* Wang, 1990, male (**A–C**) and female (**D–F**). **A, D.** Dorsal view; **B, E.** Ventral view; **C, F.** Lateral view. Scale bar: 2 mm (equal for **A–C**, equal for **D–F**).

Female (MGNU-2014-MIMC002). ***Measurements.*** Total length 7.61. Carapace 3.27 long, 2.24 wide. Abdomen 4.34 long, 3.97 wide. Sternum 1.46 long and 1.14 wide. Labium wider than long. Clypeus height 0.35. Chelicerae with 11 teeth on promargin and two on retromargin. Eye sizes and interdistances: AME 0.19, ALE 0.16, PME 0.16, PLE 0.18, AME–AME 0.21, ALE–AME 0.26, PME–PME 0.14, PME–PLE 0.39. MOA 0.55 long, anterior width 0.55, posterior width 0.41. Leg measurements: I 18.10 (4.98, 6.32, 4.83, 1.97), II 14.28 (4.14, 4.92, 3.57, 1.65), III 9.84 (3.05, 3.30, 2.12, 1.37), IV 11.46 (3.68, 3.92, 2.58, 1.68).

Habitus (Figs 4F, 5D–F). Slightly larger and lighter than male, other characters as in male.

Epigyne (Fig. 4A–C). Plate slightly longer than wide, spermathecae (Sp) distinctly visible through transparent integument. Basal plate (BP) broad, ca. 4.5 × wider than its high, with the middle part covered by the scape and with the lateral margins curved and the posterior margin concave medially, shaped like a transverse dumbbell. Scape (Sc) Y-shaped, relatively long, ca. 2/3 of epigyne length, originating near the middle area of epigynal plate, its apex distinctly overpasses the posterior margin of basal plate. Copulatory openings (CO) cambered, located posterior-bilaterally to scape. Copulatory ducts (CD) short barely distinct seen. Spermathecae (Sp) situated anteriorly, balloon-shaped, relatively large, ca. 1.15 ×longer than wide, surface smooth; two spermathecae touching each other. Fertilization duct (FD) membranous, located on dorsal-basal surface of spermathecae.

Natural history. The new materials of *M. caudatus* were found in the entrance zone of the Yaoling Cave.

Distribution. China (Guizhou, Guangxi) (Table 1; Figs 2A, 15).

Mimetus guiyang J. S. Zhang, Yu & Xu, sp. nov.

https://zoobank.org/F13FA58A-1682-4DEB-9509-987FB9FBFBCD

Figs 2A, 6, 14B, 15

Type material. ***Holotype*** • ♀ (MGNU-2017-MIMG001), China: Guizhou Pro.: Guiyang City, Dongfeng Town, 26.64°N, 106.79°E, c. 736 m, pitfall traps, 16 VI 2017–17 VII 2017, H. Yu et al. leg. ***Paratype*** • 1♀ (MGNU-2017-MIMG002), same data as holotype.

Etymology. The specific epithet is derived from the name of the type locality; noun in apposition.

Diagnosis. The female of *M. guiyang* sp. nov. can be distinguished from those of all congeners with the exception of *M. lingbaoshanensis* by having a short and narrow scape (Sc) (scape tip not reaching the posterior margin of the basal plate (Bp), and scape narrower than 1/5 of basal plate width in both species, as in Fig. 6A, C and Gan et al. 2019: 5, figs 3F, 4C, *vs.* scape tip overpassing the posterior margin of basal plate, such as *M. echinatus* and *M. yinae*, or scape tip no less than 1/5 of basal plate width, such as *M. juhuaensis* and *M. labiatus*, as in Wang 1990: fig. IV.1, Zeng et al. 2016: figs 3B, 4B, Gan et al. 2019: figs 5C, 6F, and Liu et al. 2021b: figs 4, 6A). The new species can be differentiated by the scape nearly finger-like, proximally not forked (Figs 6A, C) (*vs.* subtriangular or V-shaped, proximally forked in *M. lingbaoshanensis*; Gan et al. 2019: 5, figs 3F, 4C); and the posterior margin of basal plate's smoothness (Fig. 6A–D) (*vs.* medially slightly prominent in *M. lingbaoshanensis*; Gan et al. 2019: 5, figs 3F, G, 4C, D).

Description. Female (holotype, MGNU-2017-MIMG001). ***Measurements.*** Total length 4.65. Carapace 2.29 long, 1.58 wide. Abdomen 2.36 long, 1.87 wide. Sternum 1.02 long and 0.73 wide. Labium wider than long. Clypeus height 0.26. Eye sizes and interdistances: AME 0.13, ALE 0.12, PME 0.13, PLE 0.12, AME–AME 0.11, ALE–AME 0.16, PME–PME 0.08, PME–PLE 0.23. MOA 0.36 long, anterior width 0.37, posterior width 0.33. Leg measurements: I 11.97 (3.57, 4.17, 2.96, 1.27), II 9.06 (2.79, 3.12, 2.15, 1.00), III 5.49 (1.79, 1.80, 1.14, 0.76), IV 6.86 (2.22, 2.38, 1.51, 0.75).

Habitus (Figs 6E–G, 14B). Carapace nearly pyriform, uniformly yellowish white except cephalic region with a distinctive fan-shaped pattern starting from behind PER and almost reaching fovea; fovea nearly invisible; pars cephalica slightly narrowed, cervical groove and radial grooves indistinct; tegument smooth, clothed with short, sparse setae along the margins of cephalic pattern. Sternum yellowish, shaped like a shield. Labium band-shaped, light reddish brown. Endites anteriorly white, posteriorly colored as that of labium. Chelicerae dark, promargin with 11 peg teeth, retromargin with only one normal tooth. Leg yellowish white, with countless grey spots in the distal parts of femur and conspicuous dark brown annuli in the proximal parts of femur and tibia. Abdomen oval, yellowish white, dorsally covered by several relatively large black patches and small whitish spots; dorsum also with many binate hair bases, all hair bases ossified, among them ca. six or seven pairs relatively large and bubble-shaped, located medially; venter basically light brown, with numerous irregular, silver spots of varying sizes, centrally with a black longitudinal stripe, laterally with a black oblique stripe on each side, posteriorly with a pair of arc-shaped stripes forming a bracket-like pattern.

Epigyne (Fig. 6A–D). Plate nearly as wide as long, through which large spermathecae (Sp) are clearly visible. Hood (H) hemispherical, distinctly large, as wide as epigyne. Basal plate (Bp) large, ca. 1.9 × wider than its high, nearly trapezoidal, with slightly curved posterior and lateral margins, its anterior part hidden by the hood, and its middle part partly covered by the scape. Scape (Sc) finger-like, approximately 2/5 of epigyne length, originating near anterior margin of hood, with its apex distinctly beyond the posterior margin of hood but not reaching the posterior margin of the basal plate. Copulatory openings (CO) indistinct, hidden by the hood. Copulatory ducts (CD) short and barely visible. Spermathecae (Sp) situated anteriorly, egg-shaped, relatively large, ca. 1.2 × longer than wide, surface slightly wrinkled; two spermathecae closely spaced. Fertilization ducts (FD), membranous and curved, located on dorsal-basal surface of spermathecae.

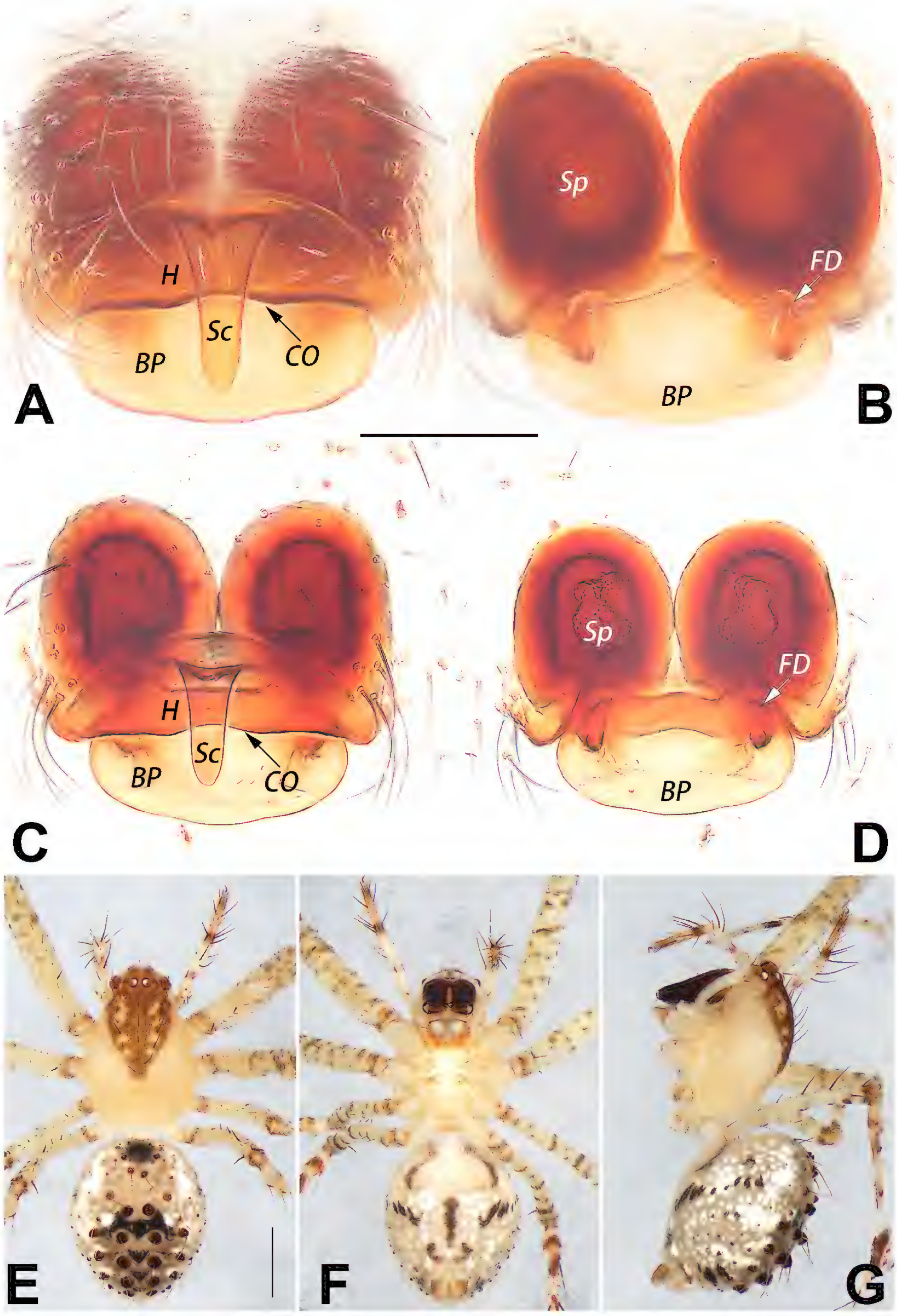

Figure 6. Holotype female of *Mimetus guiyang* sp. nov., epigyne (**A–D**) and habitus (**E–G**). **A, B.** Macerated epigyne, ventral and dorsal; **C, D.** Epigyne, macerated and embedded in Arabic gum, ventral and dorsal; **E.** Dorsal view; **F.** Ventral view; **G.** Lateral view. Abbreviations: BP = basal plate; CO = copulatory opening; FD = fertilisation duct; H = hood; Sc = scape; Sp = spermatheca. Scale bar: 0.2 mm (equal for **A–D**); 1 mm (equal for **E–G**).

Male. Unknown.

Natural history. The types were collected in a pitfall trap set in a masson pine plantation, but the specific biology of *M. guiyang* sp. nov. is not currently clear.

Distribution. Known only from the type locality (Table 1; Figs 2A, 15).

Mimetus lanmeiae Liu, Yu & Xu, sp. nov.

https://zoobank.org/126EF2A2-129C-4DFA-87BD-39D0AC121A71

Figs 2A, 7, 8, 14A, 15

Type material. ***Holotype*** • ♂ (MGNU-2022-MIML001), China: Guizhou Pro.: Guiyang City, Xinpu Town, Xiangzhigou, 26.57°N, 106.93°E, c. 1092 m, by hand, 1 VI 2022, L. Qian leg.

Etymology. The specific name is a matronym in honor of Lanmei Tang, the mother of the collector.

Diagnosis. Male of *M. lanmeiae* sp. nov. resembles that of *M. contrarius* (Zeng et al. 2019: 675, figs 1A–G, 2A–E) in having a C-shaped embolus (E), disc-shaped conductor (C), and elongated, shovel-shaped cymbial apex (CA), but differ by: (1) cymbium (Cy) with an ecto-medial process (CEMP) in the new species (*vs.* CEMP absent in the latter) (cf. Fig. 7A, B, D and Zeng et al. 2019: figs 1C, E, 2B, C); (2) paracymbium (Pc) shaped like water drop, anteriorly with a highly sclerotized thumb-shaped apophysis in the new species (*vs.* nearly triangular, medially with a small tooth-shaped apophysis in the latter) (cf. Fig. 7A, B, D and Zeng et al. 2019: figs 1E, 2C); and (3) palpal tibia approximately 1.4 × longer than wide in the new species (*vs.* palpal tibia distinctly longer than wide, the ratio of length/width is approximately 2.8 in the latter) (cf. Fig. 7A–D and Zeng et al. 2019: figs 1C–E, 2A–C).

Description. Male (holotype, MGNU-2022-MIML001). ***Measurements.*** Total length 2.14. Carapace 0.96 long, 0.86 wide. Abdomen 1.18 long, 1.05 wide. Sternum 0.48 long and 0.49 wide. Labium wider than long. Clypeus height 0.18. Eye sizes and interdistances: AME 0.09, ALE 0.08, PME 0.09, PLE 0.08, AME–AME 0.08, ALE–AME 0.03, PME–PME 0.04, PME–PLE 0.11. MOA 0.24 long, anterior width 0.24, posterior width 0.22. Leg measurements: I 6.2 (1.65, 2.15, 1.61, 0.79), II 4.92 (1.45, 1.65, 1.13, 0.69), III 2.91 (0.85, 0.91, 0.66, 0.50), IV 3.60 (1.12, 2.38, 0.75, 0.53).

Habitus (Figs 8, 14A). Carapace oval, slightly longer than wide, basically yellowish white, with a large black Y-shaped pattern (both lateral margins of pattern are wave-like lines) between ocular area and fovea; fovea inconspicuous; ocular area slightly narrowed, cervical groove and radial grooves invisible; tegument smooth, without setae. Sternum white, heart- or shield-shaped. Labium band-shaped, slightly curved, light reddish brown. Endites anteriorly white, posteriorly colored as that of labium. Chelicerae light reddish brown, promargin with eight peg teeth, retromargin with two small teeth. Leg yellowish white, with several black spots in the distal half of femur. Abdomen round, yellowish white, dorsally with whitish and dark patches, and many weakly ossified hair bases, but almost all hairs have broken off from the body; venter basically yellowish-white, anteriorly with a pair of long, arc-shaped stripes on both sides, extending ca. 1/2 of abdomen length, forming a large, bracket-shaped pattern, posteriorly with a nearly circular black spot.

Palp (Fig. 7A–D). Tibia ca. 1/3 of cymbium length, about 1.4 longer than wide. Cymbium (Cy) with a developed apex (CA), an ecto-medial process (CEMP), and a basal extension (CBE): cymbial apex elongated, ca. 1/3 of cymbium length, nearly triangular in ventral and dorsal views and shovel-shaped in both lateral views, its tip pointing ventro-retrolaterally; ecto-medial process triangular or tooth-shaped, slightly curved, apex sharp and pointing ventro-retrolaterally; cymbial basal extension thumb-like, partly membranous, its tip blunt. Paracymbium (Pc) broad, ca. 2/5 of cymbium length, with a highly sclerotized thumb-shaped apophysis. Tegulum (T) nearly circular, centrally and apically membranous, slightly excavated on prolatero-apical side to accommodate embolus; sperm duct distinct, forming a loop along tegular margin. Tegular apophysis (TA) triangular in ventral view and papilliform in prolateral view, located at proximal-prolateral position of tegulum (ca. 8–9 o'clock position of tegulum). Subtegulum (St) located postero-retrolaterally to tegulum, without apophysis. Embolus (E) C-shaped, arising at 6–7 o'clock position, terminating at ca. 12 o'clock position. Conductor (C) large, disc-shaped, slightly extending outward, membranous centrally and strongly sclerotized marginally, its anterior margin folded to cover the tip of emblous (ET).

Female. Unknown.

Natural history. The holotype of *Mimetus lanmeiae* **sp. nov.** was found on a spider web (Fig. 8D), which may show a mimicry behavior (mimicking the movements of a prey trapped in the host web to attract, attack, and feed upon the resident spider as mentioned in Liu et al. (2021b)).

Distribution. Known only from the type locality (Table 1; Figs 2A, 15).

Mimetus sinicus Song & Zhu, 1993

Figs 2A, 9–11, 14C, D, 15

Mimetus sinicus Song and Zhu 1993: 421, figs 1–5 (♂♀); Song and Li 1997: 400, fig. 1A–E (♂♀); Song et al. 1999: 74, figs 11K, 30H, I, S, T (♂♀).

Material examined. • 5♂♂5♀♀ (MGNU-2022-MIMS001 to 010), China: Guizhou Pro.: Guiyang City, Xinpu Town, Xiangzhigou, 26.79°N, 106.91°E, c. 1092 m, by beating, 31 V 2022, H. Yu et al. leg.

Diagnosis and description. See Song and Zhu (1993). Male palp as in Fig. 9A–C, epigyne as in Fig. 9D, E, habitus as in Figs 10, 14C, D, living specimens as in Fig. 11.

Distribution. China (Guizhou, Hubei) (Table 1; Figs 2A, 15).

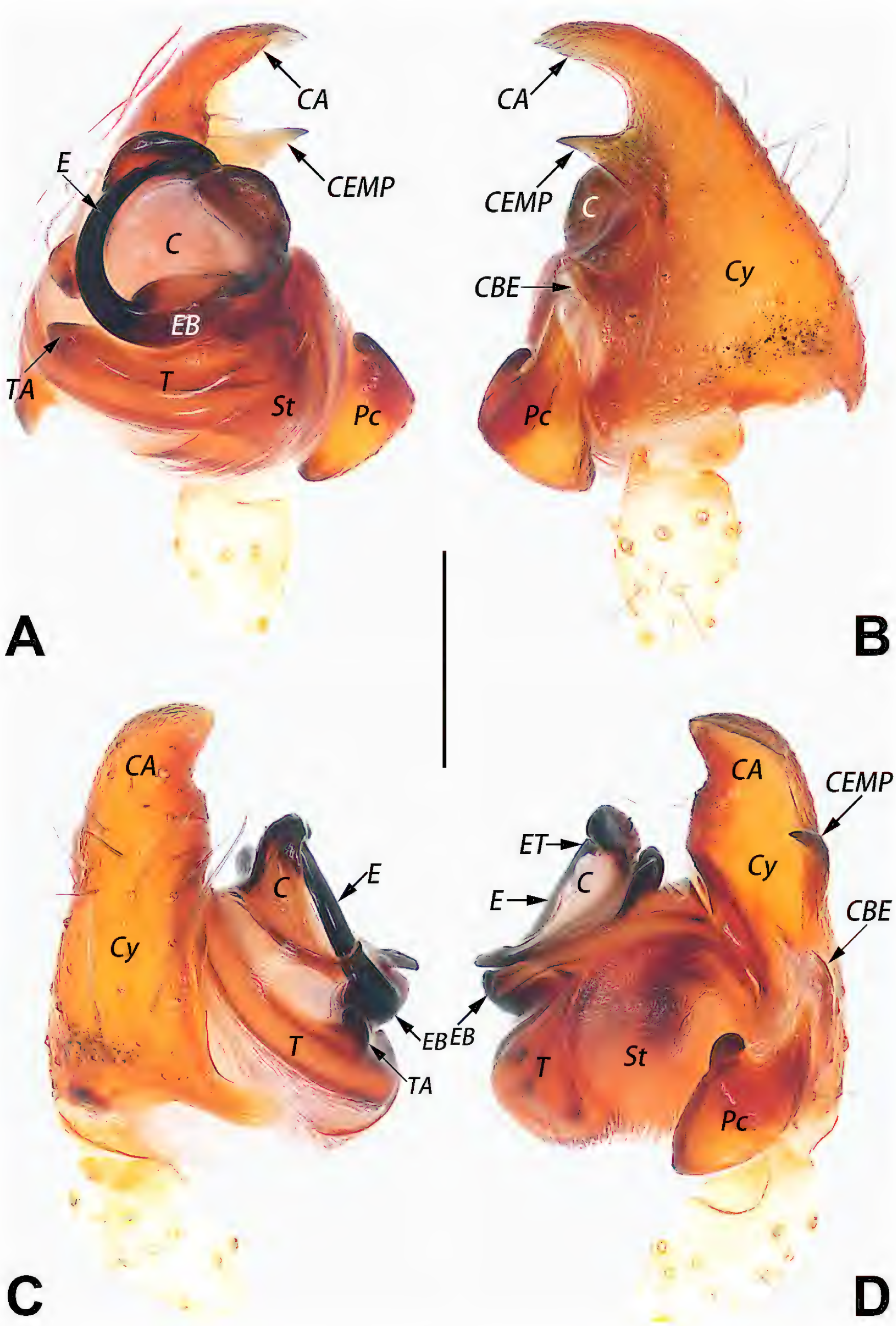

Figure 7. Male palp of the holotype of *Mimetus lanmeiae* sp. nov. **A.** Ventral view; **B.** Dorsal view; **C.** Prolateral view; **D** Retrolateral view. Abbreviations: C = conductor; CA = cymbial apex; CBE = cymbial base extension; CEMP = cymbial ecto-medial process; Cy = cymbium; E = embolus; EB = embolar base; ET = embolar tip; Pc = paracymbium; St = subtegulum; T = tegulum; TA = tegular apophysis. Scale bar: 0.2 mm (equal for **A–D**).

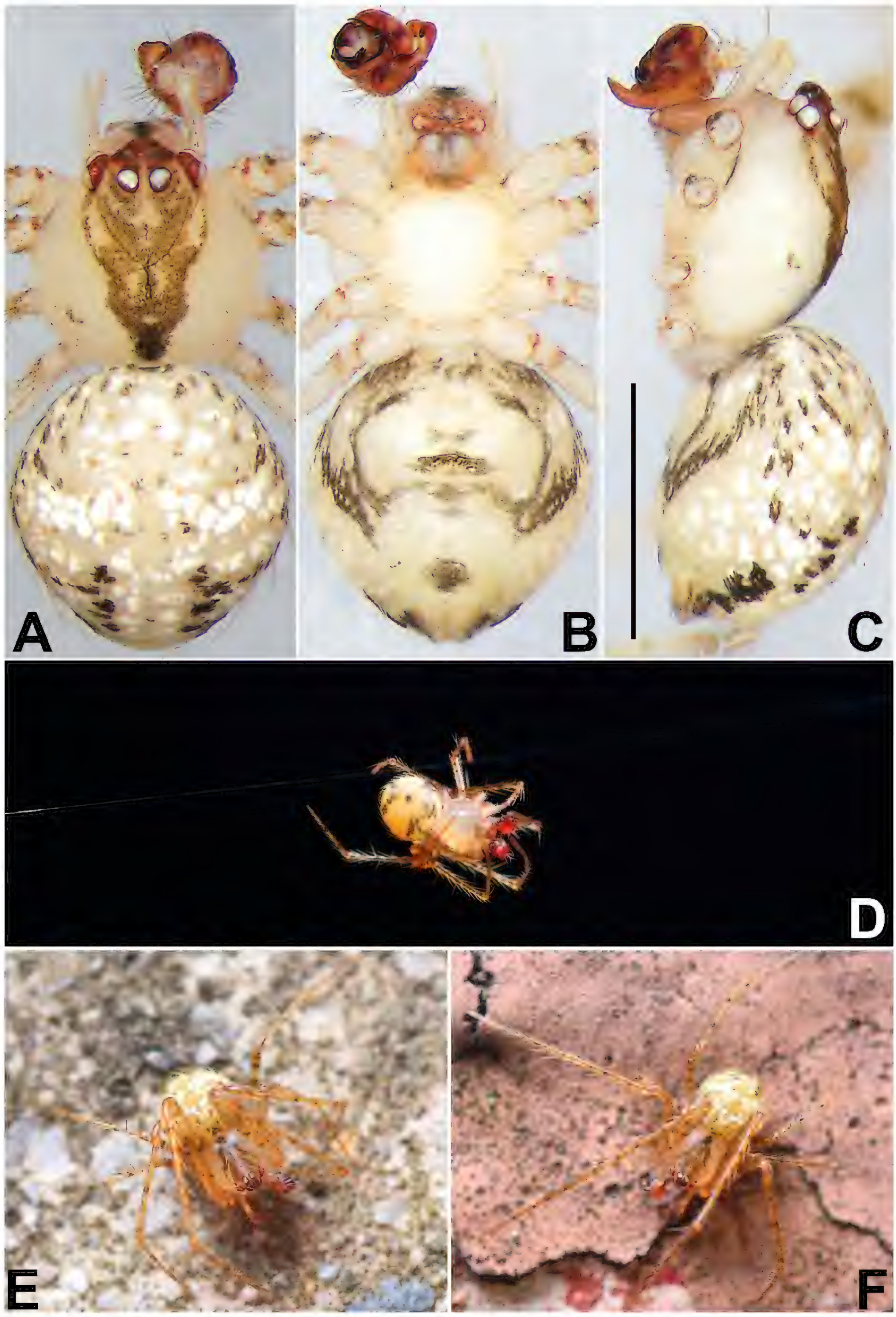

Figure 8. Male holotype of *Mimetus lanmeiae* sp. nov., habitus (**A–D**) and living specimen (**D–F**). **A.** Dorsal view; **B.** Ventral view; **C.** Lateral view; **D.** Spider on web; **E, F.** Spider dropped on the ground. Photographs of living specimen by Q Lu (Shenzhen).Scale bar: 1 mm (equal for **A–C**).

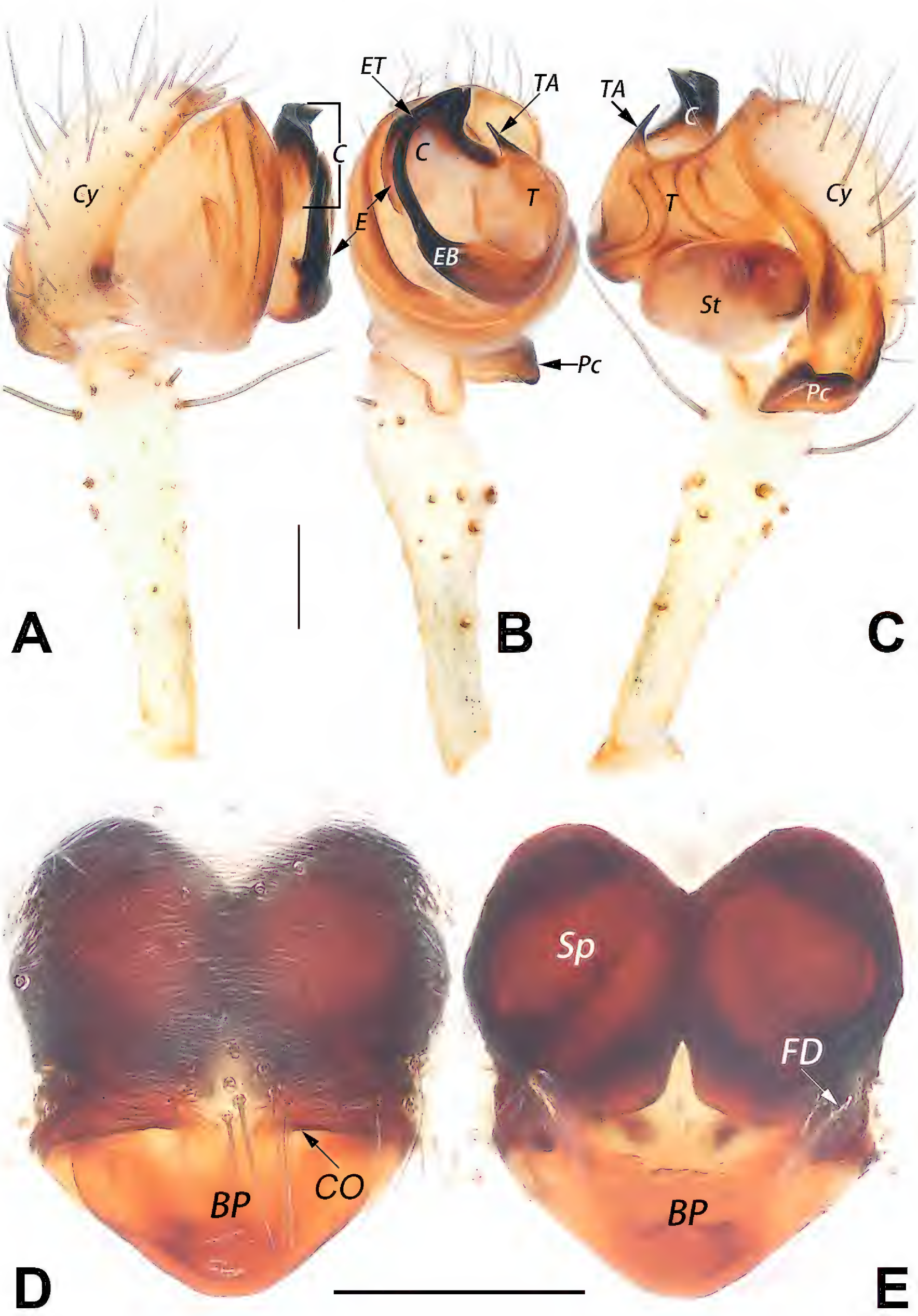

Figure 9. Male palp (**A–C**) and female epigyne (**D, E**) of *Mimetus sinicus* Song & Zhu, 1993. **A–C.** Prolateral, ventral, and retrolateral view; **D–E.** Macerated epigyne, ventral and dorsal. Abbreviations: BP = basal plate; C = conductor; CO = copulatory opening; Cy = cymbium; E = embolus; FD = fertilisation duct; EB = embolar base; ET = embolar tip; Pc = paracymbium; Sp = spermathecae; St = subtegulum; T = tegulum; TA = tegular apophysis. Scale bar: 0.2 mm (equal for **A–C**, equal for **D, E**).

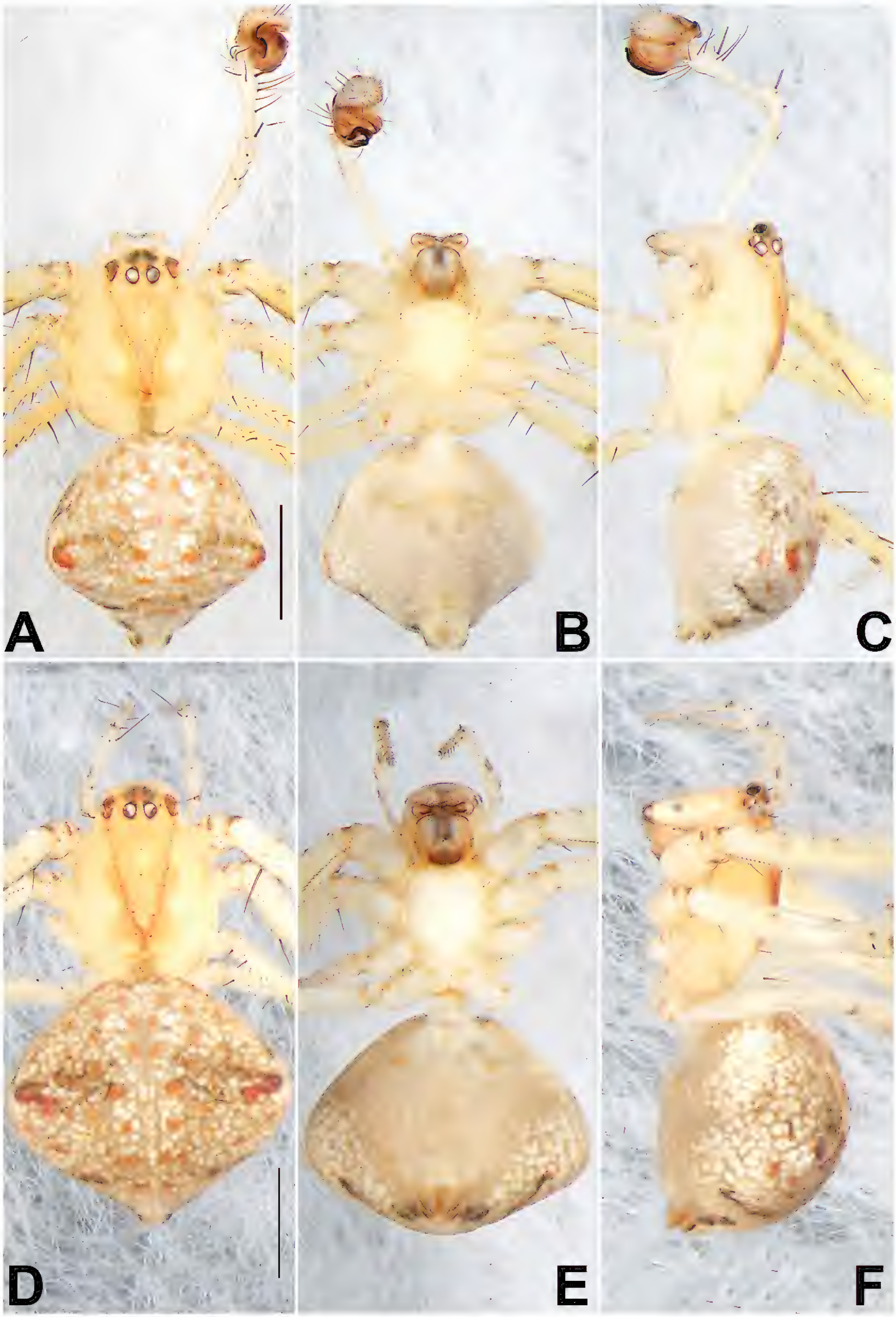

Figure 10. Habitus of *Mimetus sinicus* Song & Zhu, 1993, male (**A–C**) and female (**D–F**). **A, D.** Dorsal view; **B, E.** Ventral view; **C, F.** Lateral view. Scale bar: 1 mm (equal for **A–C**, equal for **D–F**).

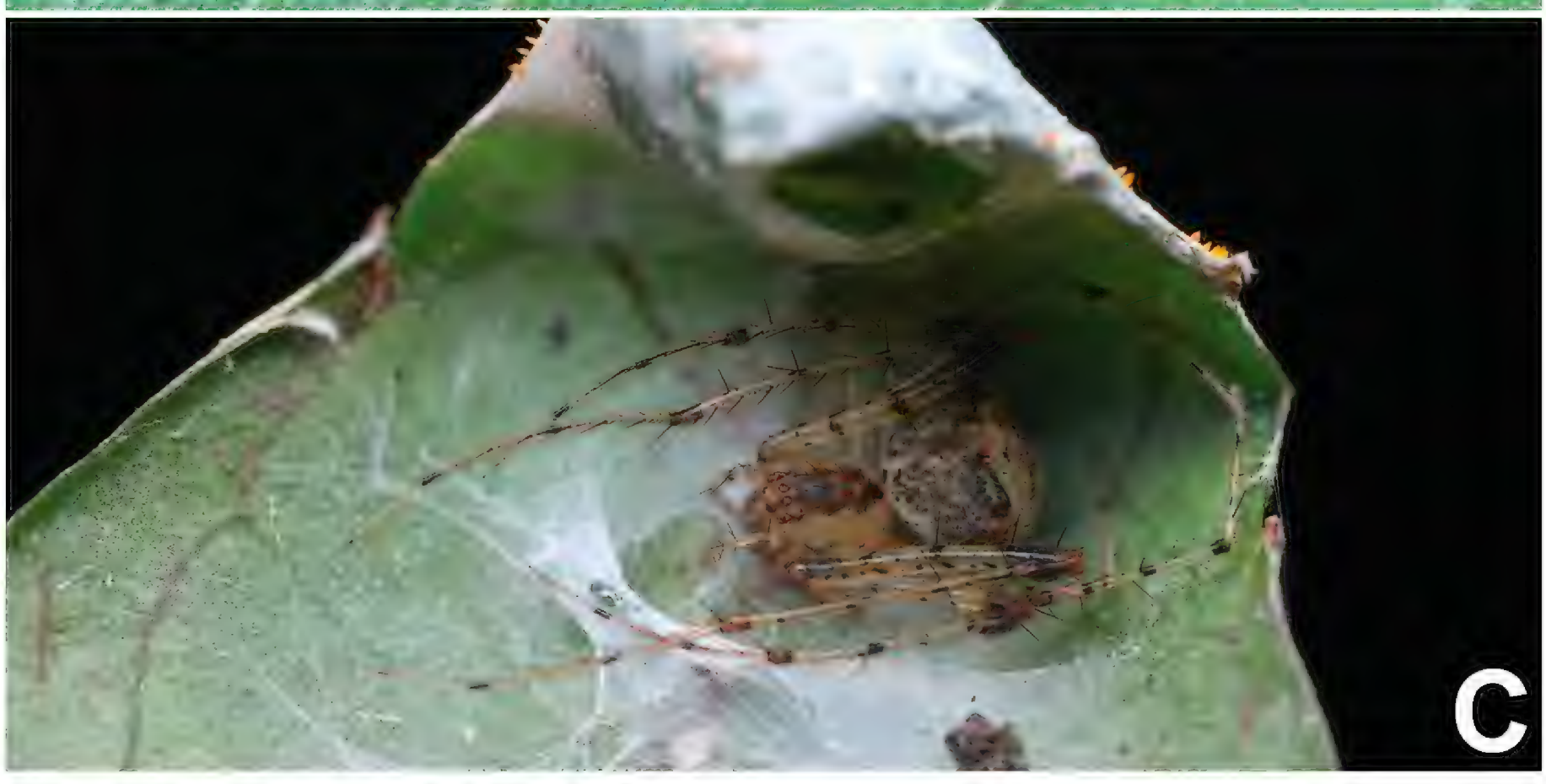

Figure 11. *Mimetus sinicus* Song & Zhu, 1993, male (**A**) and female (**B–C**), living specimens. Photographs of living specimens by Q Lu (Shenzhen).

Mimetus testaceus Yaginuma, 1960

Figs 2A, 12, 13, 14E, F, 15

Mimetus testaceus Yaginuma 1960: append. 3, plate. 15, fig. 93, fig. 101G (♀); Paik 1967: 190, fig. 3, 16–21 (♂♀); Wang 1990: 40, fig. III.5–11 (♂♀); Chen and Zhang 1991: 182, fig. 179.1–5 (♂♀); Song et al. 1999: 74, fig. 30J, K, U, V (♂♀). For a full list of taxonomic references, see WSC (2025).

Material examined. • 2♂♂3♀♀ (MGNU-2022-MIMT001 to 005), China: Guizhou Pro.: Guiyang City, Shuitian Town, Panlongshan Forest Park, 26.74°N, 106.88°E, c. 1072 m, by beating, 2 VI 2022; H. Yu et al. leg.

Diagnosis and description. See Paik (1967). Male palp as in Fig. 12A–C, epigyne as in Fig. 12D, E, habitus as in Figs 13, 14E, F, living specimens as in Fig. 12F, G.

Distribution. China (Hunan, Guangxi, Guizhou, Zhejiang) (Table 1; Figs 2A, 15).

Discussion

The genetic barcode technique (DNA barcodes), based on sequencing of the mitochondrial marker cytochrome c oxidase subunit I (COI), has proven a useful, complementary tool to overcome species limitations and sex matching in taxonomic studies of many spider groups (Barone et al. 2024; Blagoev et al. 2016; Čandek and Kuntner 2015; Xu et al. 2015, 2017; Coddington et al. 2016; Tyagi et al. 2019; Zhang et al. 2021a, b). A preliminary molecular species delimitation was conducted using the DNA barcoding gap method, based on all available COI sequences of the genus *Mimetus* (including both self-sequenced and all sequences downloadable from NCBI). According to the results (unpublished), a distinct gap was observed between intraspecific and interspecific genetic distances, ranging from 4.18% to 6.85% for K2P and from 4.04% to 6.50% for p-distance, indicating that even single-locus analyses based on the COI barcodes, when integrated with morphological data and collection experience, may provide sufficiently reliable species delimitation for *Mimetus*.

Therefore, we prioritize using the COI sequence for sex matching in the present paper. However, the lack of fundamental data (currently, we can obtain COI sequences for only eight *Mimetus* species through NCBI, and among them, only one species, *M. testaceus*, is from China; NCBI 2025) and the inability to obtain high-quality DNA from some specimens (we were unable to obtain good extractions from *M. guiyang* sp. nov. and *M. caudatus*) compel us to seek alternative methods or criteria to solve the issue.

In almost all *Mimetus* spp., there is no significant sexual dimorphism in body size, pattern, and coloration, such as in *M. caudatus* (cf. Figs 4E, 5A–C, and Figs 4F, 5D–F), *M. sinicus* (cf. Figs 10A–C, 11A, 14C, and Figs 10D–F, 11B, C, 14D), and *M. testaceus* (cf. Figs 12F, 13A–C, 14E, and Figs 12G, 13D–F, 14F). Therefore, this relatively low degree of sexual dimorphism can serve as a reference for determining whether specimens of different sexes are conspecific. Furthermore, we used two criteria for matching the opposite sexes: the combined occurrence of males and females in several samples and compatibility of epigyne and male palpal structure.

Up to now, four described *Mimetus* species (*M. caudatus* is excluded) from China are known from males only: *M. bucerus*, *M. clavatus*, *M. lamellaris*, and *M. uncatus* (WSC 2025; Table 1). However, none of them could be matched with *M. guiyang* sp. nov. due to their different habitus: the abdomen dorsally with peculiar, large, bubble-shaped, ossified hair bases in *M. guiyang* sp. nov., but the hair bases are absent or indistinct in *M. bucerus*, *M. clavatus*, *M. lamellaris*, and *M. uncatus* (Gan et al. 2019: fig. 1A; Liu et al. 2021a: figs 9A, B, 20A, B; Zeng et al. 2016: fig. 9A).

According to the WSC (2025), two described species of *Mimetus* from China are known from females only: *M. labiatus* and *M. tuberculatus* (Table 1). However, neither could be matched with *M. lanmeiae* sp. nov. due to their different sizes and habitus. *M. lanmeiae* sp. nov. with a 2.14 mm body length, its abdomen round and smooth, without humps, and the dorsal surface of the abdomen with whitish and dark patches (Fig. 8). In contrast, *M. labiatus* possesses a 5.80 mm body length, its abdomen is elongate-oval and dorsally with several pairs of diagonal, claviform bands (Yin et al. 2012: 199, fig. 53a), and *M. tuberculatus* has a 4.80 mm body length, its abdomen with three pairs of tubercles (Liang and Wang 1991: 61).

Both *M. guiyang* sp. nov. and *M. lanmeiae* sp. nov. were collected from Guiyang City; however, the two can also be considered as separate species due to their different sizes (female with 4.65 mm body length vs. male with 2.14 mm) and their different habitus (abdomen dorsally with many large bubble-shaped hair bases as in Fig. 6E, G, vs. with many small and indistinct hair bases as in Fig. 8A, C). Moreover, there is a great possibility that two new species will be assigned to different species groups or genera in the future (*Mimetus* will likely be split when more data is available). Based on the characters of copulatory organs, Liu et al. (2021b: 574) divided the Chinese *Mimetus* into three types (or groups). It appears that *M. guiyang* sp. nov. and *M. caudatus* should belong to the first type, which presents a distinct set of genitalic characters: basal plate (Bp) of epigynum oblong and scape (Sc) of epigynum conspicuous in female (as shown in Figs 4A–D, 6A–D); conductor (C) cylindrical, strongly sclerotized, and extending outward; embolus (E) originating at the position of 6 o'clock and extending along the conductor (C) in male (Fig. 3A–D). Obviously, *M. lanmeiae* sp. nov. possesses no characters associated with the type (or group), which includes *M. guiyang* sp. nov. and *M. caudatus*, due to lacking the features just mentioned. Consequently, it is currently impossible to discern any obvious derived features that could indicate a close relationship between *M. guiyang* sp. nov. and *M. lanmeiae* sp. nov.

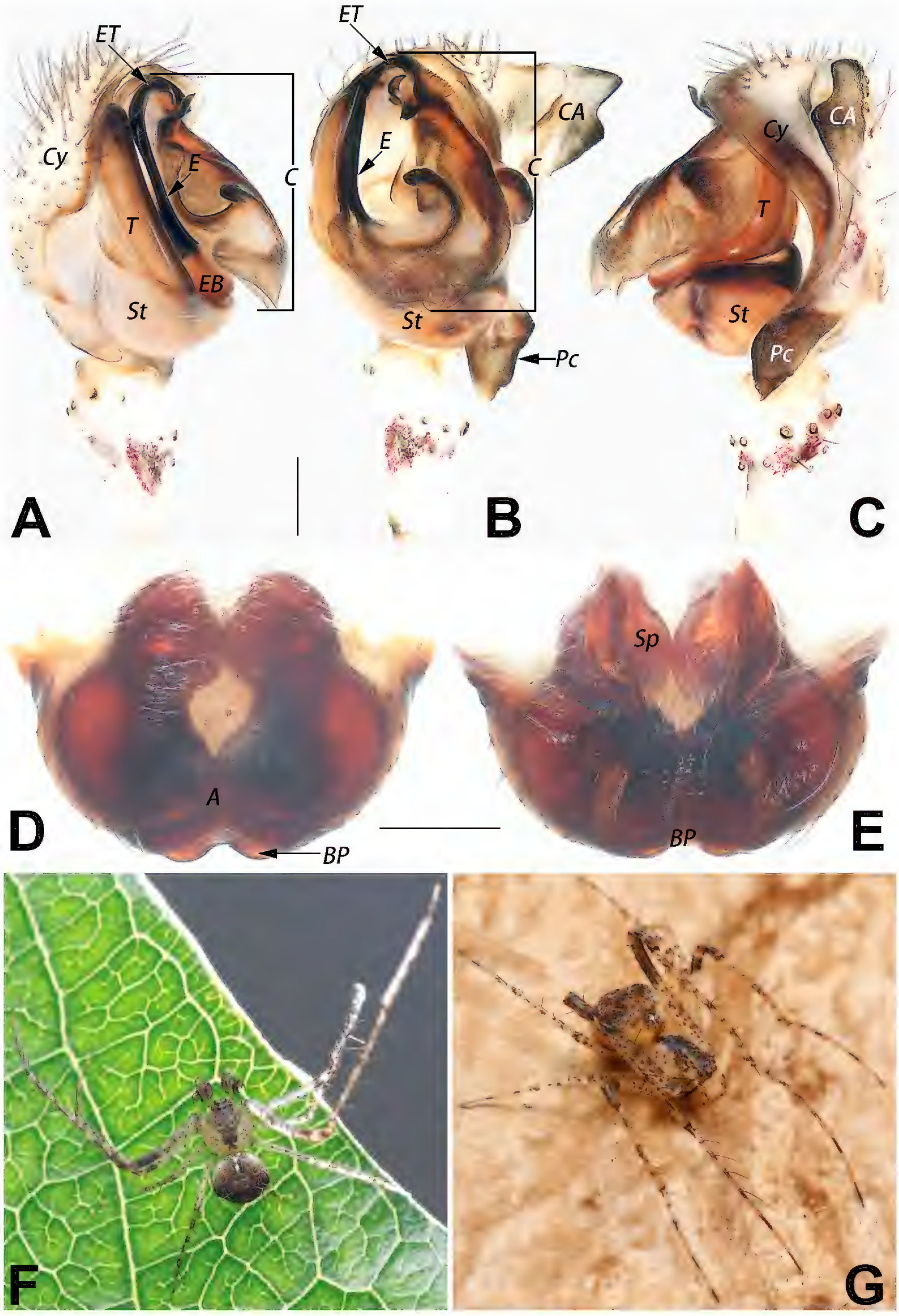

Figure 12. Male palp (**A–C**), female epigyne (**D, E**) and living specimens (**F, G**) of *Mimetus testaceus* Yaginuma, 1960. **A–C.** Prolateral, ventral, and retrolateral view; **D, E.** Macerated epigyne, ventral and dorsal; **F, G.** Male and female Abbreviations: A = atrium; BP = basal plate; C = conductor; CA = cymbial apex; Cy = cymbium; E = embolus; EB = embolar base; ET = embolar tip; Pc = paracymbium; Sp = spermathecae; St = subtegulum; T = tegulum. Photographs of living specimen by Q Lu (Shenzhen). Scale bar: 0.5 mm (equal for **A–C**); 0.2 mm (equal for **D, E**).

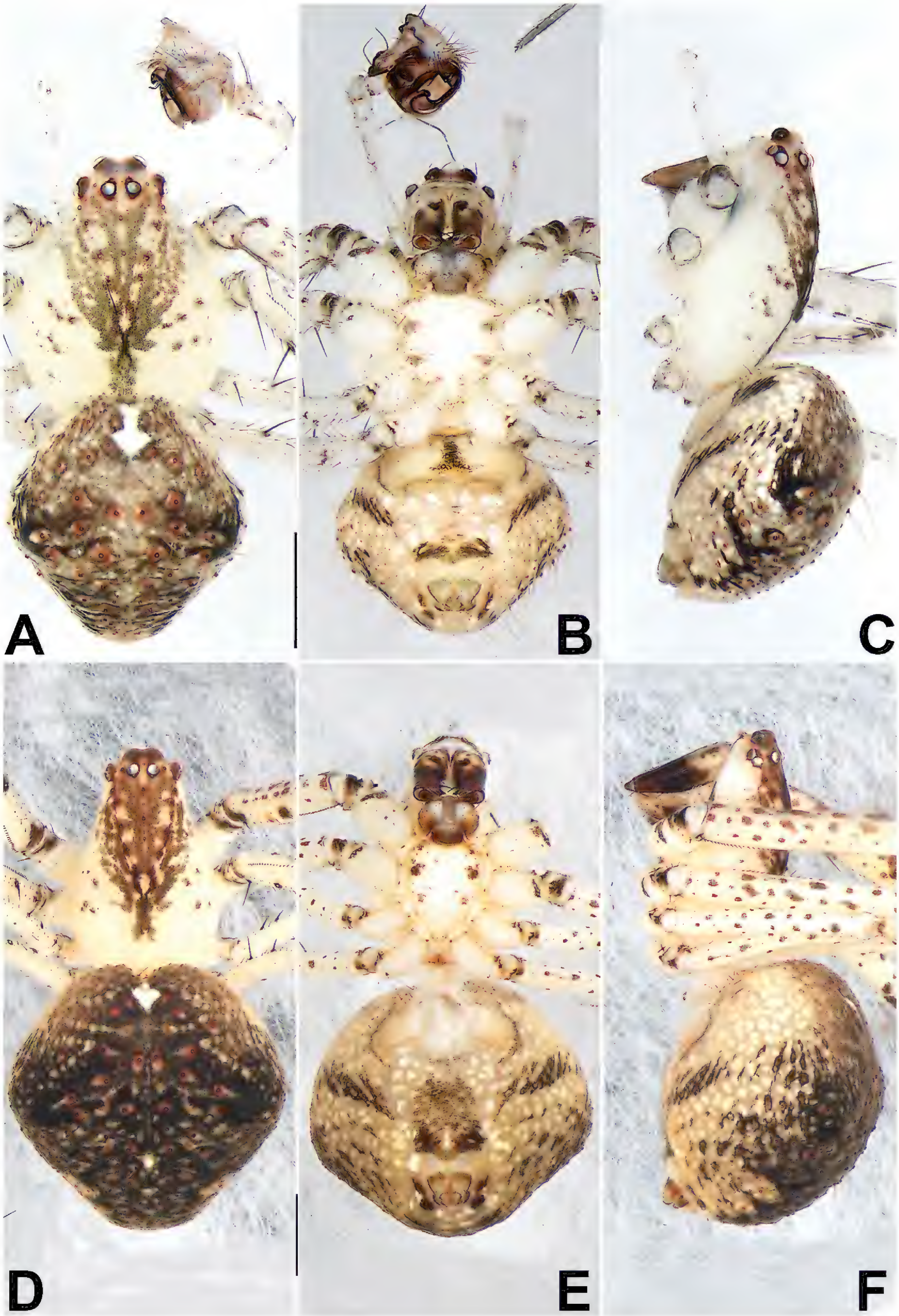

Figure 13. Habitus of *Mimetus testaceus* Yaginuma, 1960, male (**A–C**) and female (**D–F**). **A, D.** Dorsal view; **B, E.** Ventral view; **C, F.** Lateral view. Scale bar: 1 mm (equal for **A–C**, equal for **D–F**).

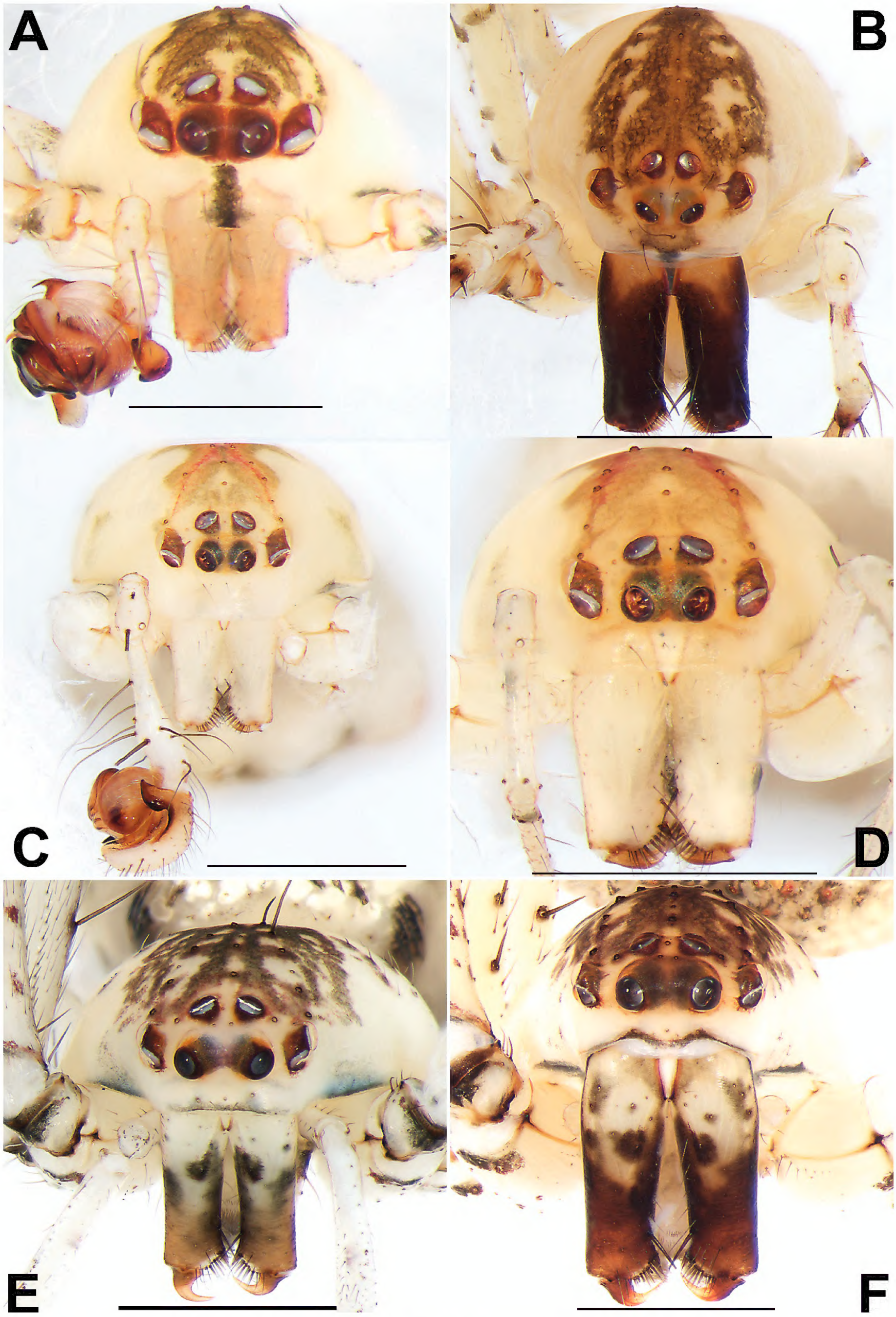

Figure 14. Frontal view of the prosoma of *Mimetus* spp. treated in this paper. **A.** *Mimetus lanmeiae* sp. nov.; **B.** *Mimetus guiyang* sp. nov.; **C, D.** *Mimetus sinicus*, male and female; **E, F.** *Mimetus testaceus*, male and female. Scale bars: 0.5 mm (**A**); 1 mm (**B–F**).

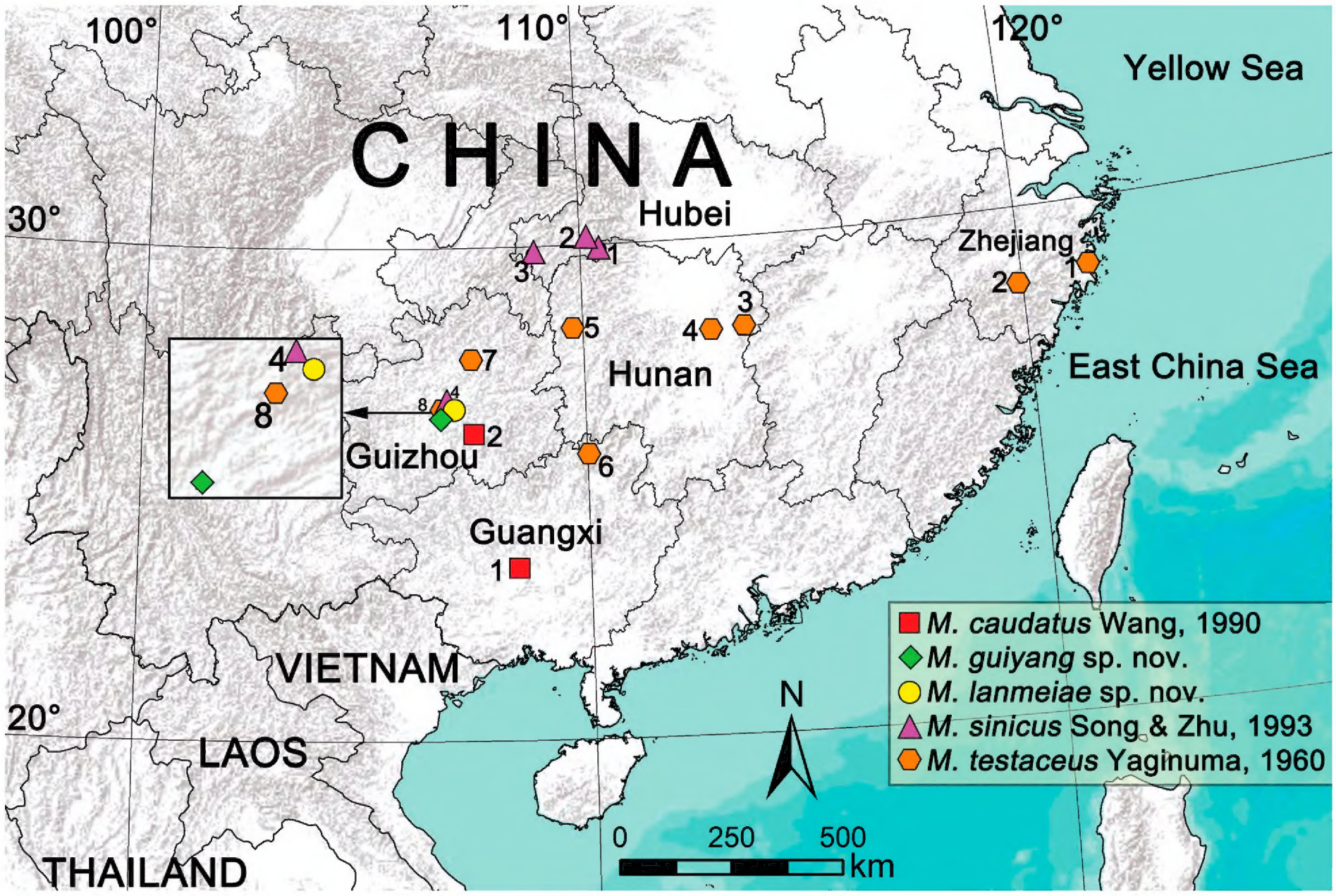

Figure 15. Distribution records of the *Mimetus* species treated in this paper: *Mimetus caudatus* Wang, 1990 (scarlet square: 1. Guangxi Zhuang Autonomous Region, Mt. Daming; 2. Guizhou Province, Dunyun City, Xiaoweizhai Town, Yaolin Cave), *M. guiyang* sp. nov. (green rhombus: Guizhou Province, Guiyang City, Dongfeng Town), *M. lanmeiae* sp. nov. (yellow circle: Guizhou Province, Guiyang City, Xinpu Town, Xiangzhigou), *M. sinicus* Song & Zhu, 1993 (purple triangle: 1. Hubei Province, Hefeng County; 2. Hubei Province, Xuanen County; 3. Hubei Province, Xianfeng County; 4. Guizhou Province, Guiyang City, Xinpu Town, Xiangzhigou), *M. testaceus* Yaginuma, 1960 (orange hexagon: 1. Zhejiang Province, Taizhou City; 2. Zhejiang Province, Lishui City; 3. Hunan Province, Liuyang City; 4. Hunan Province, Mt. Yuelu; 5. Hunan Province, Zhangjiajie City; 6. Guangxi Zhuang Autonomous Region, Longsheng County; 7. Guizhou Province, Zunyi City; 8. Guizhou Province, Guiyang City, Shuitian Town, Panlongshan forest park).

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